Atlantis on track for sixth mission to Mir station

By Kyle Herring

Despite a delay in moving from the Orbiter Processing Facility to the Vehicle Assembly Bldg., *Atlantis* continues on course for the STS-84 launch shortly after 3 a.m. CDT May 15 to begin its sixth straight trip to the Russian Mir Space Station.

The holdup in the move to the VAB was prompted by inspections of bolt holes that have exhibited a small amount of elongation with loads during the separation of the external tank shortly after main engine cutoff. The bolts hold a protective cover called a "pyro can" in place on top of the pyrotechnic device and explosive bolt that initiates separation.

Managers elected to make a one-flight-only adjustment to provide insurance in the unlikely event that the original holes may fail. The potential problem will be resolved with a permanent fix on the other three orbiters and *Atlantis* after the May mission.

The adjustment essentially allows for the temporary installation of three additional bolts and pins to ensure the desired margin of safety. The work was expected to begin shortly after *Atlantis* reaches the launch pad for the final weeks of preparation prior to launch. Shuttle managers plan to meet next Wednesday in the traditional Flight Readiness Review to select the actual launch date.

The sixth docking mission's primary goal is to deliver Mike Foale to the station and return Jerry Linenger following a four-month stay. In addition to Foale and Linenger, STS-84 crew members are Commander Charlie Precourt, Pilot Eileen Collins and Mission Specialists Jean-François Clervoy, Carlos Noriega, Ed Lu and Elena Kondakova.

Meanwhile, engineers around the agency are preparing to support a reflight of *Columbia* and its Microgravity Science Laboratory after the STS-83 mission was cut short earlier this month. Though it appears possible that the reflight will fit the schedule behind *Atlantis*, managers are continuing to evaluate the training requirements and processing flows as they relate to downstream missions. The mission was cut short earlier this month when a fuel cell exhibited an unacceptable internal voltage differential. Troubleshooting on the fuel cell so far has not recreated the anomaly on orbit.

Discovery continues to be prepared for its next flight to deploy and retrieve a science satellite to study Earth's atmosphere.

First use of Orlan suits

Linenger to become first American space walker outside Mir

By Karen Schmidt

Astronaut Jerry Linenger is expected to don a Russian Orlan space suit next week and venture out of the Mir Space Station, becoming the first American to conduct a space walk in a Russian suit.

He will be joined in space by Mir 23 Commander Vasily Tsibliev while Flight Engineer Alexander Lazutkin remains inside to monitor the space walkers' progress. Linenger and Tsibliev will deploy two experiments and retrieve two others. The crew also will evaluate a space station common tether and report back to American and Russian training instructors how well they were prepared for the five and a half-hour venture into the cold environment of space.

"I'm using the new Orlan M," Linenger said before his flight to the Russian station. "And it's the first time anyone's used the suit. Tsibliev and myself will be going out in basically a rebuilt, brand new sort of Russian suit. So it's going to be an interesting space walk."

This week Linenger and Tsibliev spent time checking their space suits, which arrived on a Progress resupply vehicle earlier this month. They also reviewed procedures and training material and watched a video on how to prepare the Mir's airlock. One of the two experiments to be deployed, the Optical Properties Monitor, also received a checkout prior to its deployment.

The crew will emerge from the Kvant 2 module on the Russian outpost and Linenger will tether himself to Mir's crane. The crane is used much like the shuttle's robot arm to transfer crew members and equipment to various locations on the station. Tsibliev will operate the crane, positioning Linenger near the docking module where Linenger will attach the Optical Properties Monitor. The experiment is designed to measure the effect of the space environment on a variety of materials ranging from telescope mirrors to spacecraft coatings.

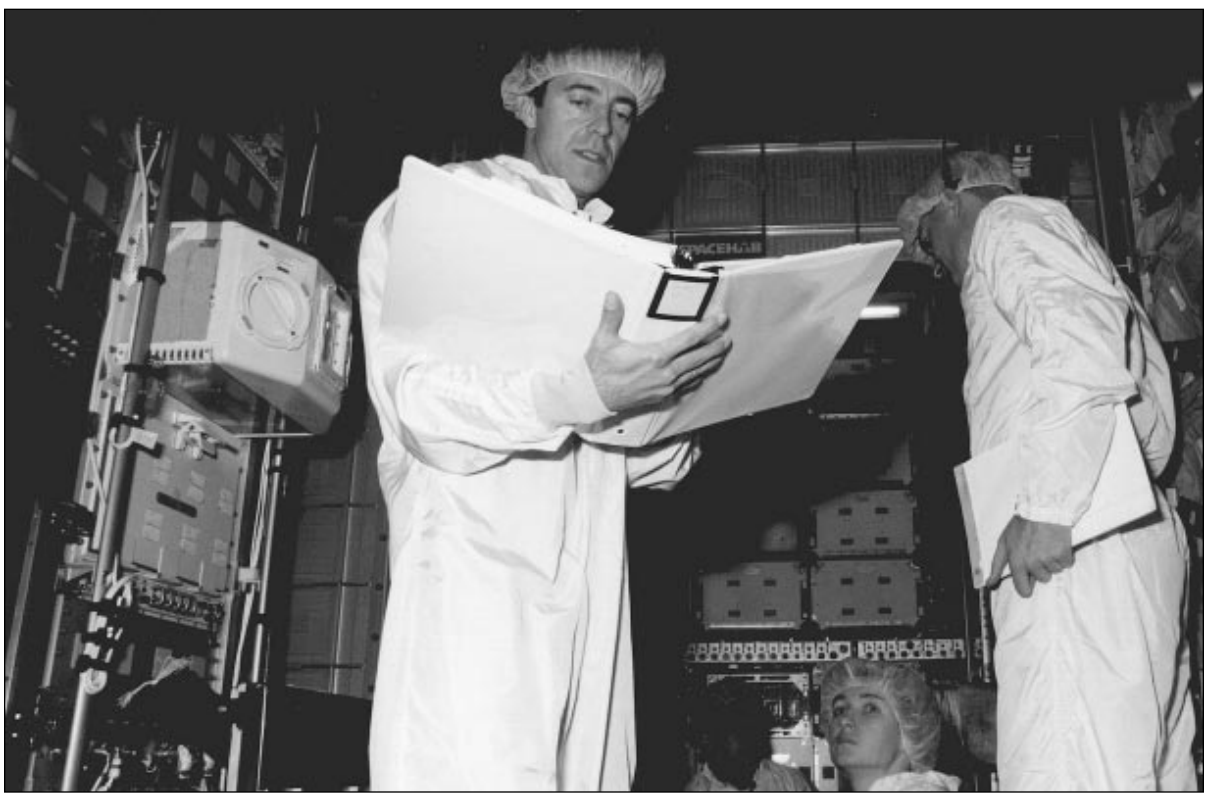
"We have a lid that will open up and it will expose a lot of different materials…glasses, things like that, to the environment of space," Linenger said. "We'll actually get real time readings. We'll hook up some data cables and power cables, and thoughout the flight we'll be able to take a look at these samples."

Once the experiment is up and running, Tsibliev will bring Linenger back to the Kvant-2 module, and the two space walkers will retrieve the Mir Sample Return Experiment. The MSRE was deployed by Mir 21 Cosmonauts Yuri Onufrienko and Yuri Usachev last year. The experiment has been gathering information on cosmic dust; and scientists hope to analyze the samples for chemical, organic and isotopic composition that can lead to a better understanding of the external environment of Mir.

Once the MSRE is temporarily stowed in the airlock, Linenger and Tsibliev will deploy a radiation detection device on the Kvant-2 module.

The space walkers' final task will be to retrieve the Particle Impact Experiment. PIE also was deployed by Onufrienko and Usachev last year. Data from this experiment will give scientists more information on the mineral composition of cosmic dust. Both the MSRE and PIE experiments will return to Earth onboard *Atlantis* during STS-84.

"During dark passes I will basically have to stop working and just hang on, and view the stars, which will be a great moment," Linenger said. "I will definitely feel alone out there in the dark by myself. It's going to be an interesting time out there…out in the deep space by myself."



NASA Photo KSC-97PC-500

INTERNATIONAL CREW—STS-84 crew members traveled to Kennedy Space Center last month to participate in the crew equipment integration test inside the Spacehab double module. From left are Mission Specialists Jean-François Clervoy of the European Space Agency, Edward Tsang Lu and Elena Kondakova of the Russian Space Agency. The three astronauts will fly aboard *Atlantis* with Commander Charlie Precourt, Pilot Eileen Collins and Mission Specialists Carlos Noriega and Mike Foale to pick up American Jerry Linenger at the Russian Mir Space Station. Foale will replace Linenger for a four-month stay on the Russian outpost.

NASA revises station launch schedule

NASA managers consider options to shuttle manifest

By James Hartsfield

NASA will begin its on-orbit assembly of the International Space Station no later than October 1998, and is looking at options that will allow the agency to work around the delay caused by the late arrival of a key station module.

"We knew from the outset that building an International Space Station was going to be tremendously challenging. Space exploration is not easy or predictable," said NASA Administrator Daniel S. Goldin. "We will work through this schedule issue, and we undoubtedly will face additional problems in the future. But we are well on our way to the realization of this world-class facility," he said.

The on-orbit assembly of the station originally was scheduled to begin in November 1997 with the launch of the NASA-financed/Russian-built and launched Functional Cargo Block, or FGB. Inadequate funding by the Russian government to the Russian Space Agency and its contractors for building another key station element—the Service Module—has put construction up to eight months behind.

NASA managers and engineers have been reviewing options to mitigate the impact to the program of the current schedule slip of the Service Module, and to begin the steps necessary to mitigate the impact of potential additional Russian delays. RSA has been a joint participant in the effort to identify these steps. Options under consideration are:

• Modify the FGB to allow for on-orbit refueling and upgrade of its avionics capability. These changes will give the FGB the capability to augment the early control and reboost capabilities to protect for a Service Module delay.

• Develop an Interim Control Module in conjunction with the Naval Research Laboratory to provide reboost capability and attitude control in the event that the SM experiences further delays, or propellant storage/reboost capability if the SM is launched on time. Consider the installation of life support systems in the U.S. lab to allow early human presence on the ISS.

• Define options involving the ICM to provide the functions of a permanent propulsion module in order to complement Russian logistics capability and to provide roll control to replace or complement the Russian Science Power Platform functions.

NASA will determine the timing for decisions which need to be made in the event that Russia is unable to provide its agreed contributions to the ISS program. These decision points will be selected to allow for the timely provision of an alternative capability.

NASA has begun initial steps at the working level to accommodate changes to the space shuttle manifest. Additional adjustments to the remainder of the assembly sequence will be worked in consultation with the other International Partners and research community over the next several weeks.

Total health presents sports injury speaker

The Total Health Program will host a Sports Injuries presentation from 11:30 a.m.-12:30 p.m. Wednesday, May 7, in Bldg. 4 South Rm. 6600.

Dr. Marty Ivey, professor of Orthopedic Surgery and chief of the Division of Sports Medicine at the University of Texas Medical Branch in Galveston, is the featured speaker.

Ivey is past president of the Texas Society of Sports Medicine and is a member of the American Orthopedic Society of Sports Medicine. He has been active in the care of Olympic athletes and served as team physician for the Pan American games in Cuba in 1991.

Employees are invited to listen to this distinguished scholar and physician who is recognized as an expert in the care and prevention of athletic injuries.

For additional information contact Greta Ayers at x30302.

Internet News: Celebrate Earth Day by surfing Web

Many historians trace the birth of the modern ecology movement to the early Apollo program, when images of the Earth taken by astronauts orbiting the Moon provided the first true picture of how small and fragile "spaceship Earth" is from a cosmological perspective.

With JSC celebrating Earth Day this week, it's appropriate to highlight the continued expansion of NASA's database of Earth observations photography.

"Earth from Space: An Astronaut's Views of the Home Planet," is a sample of the "Best 500" astronaut photographs of the Earth taken from the NASA Space Shuttle Earth Observations Photography database of more than 250,000 images, which is a national treasure.

The Best 500, which can be found at http://earth.jsc.nasa.gov, was compiled by the Space and Life Sciences Directorate's Earth Science Branch, led by Kamlesh Lulla, with assistance from Flight Crew Operations Directorate's Astronaut Office, and the Information Systems Directorate's Imagery and Publications and Information Technology Offices. The site's webmaster and author of the versatile interactive index, is Brett Staib.

The images, which were taken by astronauts and highlight interesting human and geological features and processes, are accompanied by captions that provide detailed information about surface features and why they are of interest to scientists studying the ecosystem. They are divided into categories of cities, Earth landscapes, Earth-human interactions, distinctive features, hurricanes and weather, Earth's water habitats and geographic regions. A technical search page also provides a search criteria entry form where Internet visitors may narrow their search research through six different "and/or" criteria.